COIT20260 *Cloud Computing and Things for Smarter Applications*
Term 1 - 2024

Profile information current as at 11/05/2024 07:07 am

All details in this unit profile for COIT20260 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

Emerging technologies, such as cloud computing and the Internet of Things (IoT), enable you to rapidly design, develop and deploy smart applications. In this unit, you are introduced to the software, devices, and techniques supporting these technologies. You will learn the fundamentals of cloud computing as well as various cloud environments and services, such as Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). You will use a Platform as a Service (PaaS) cloud environment, gaining practical experience in designing, developing and deploying smarter cloud-based applications.

Details

Career Level: *Postgraduate*
Unit Level: *Level 9*
Credit Points: *6*
Student Contribution Band: *8*
Fraction of Full-Time Student Load: *0.125*

Pre-requisites or Co-requisites

Pre-requisite units: COIT20245 Introduction to Programming and COIT20246 ICT Services Management
Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the Assessment Policy and Procedure (Higher Education Coursework).

Offerings For Term 1 - 2024

- Online

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

Regional Campuses

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

Metropolitan Campuses

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**
Weighting: 20%
2. **Group Work**
Weighting: 30%
3. **Project (applied)**
Weighting: 50%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the University's Grades and Results Policy for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the CQUniversity Policy site.
You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the CQUniversity Policy site.

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from Unit Coordinator's reflection

Feedback

There is a heavy focus on IBM Cloud, so students do not get exposure to other widely used cloud computing environments

Recommendation

Investigate a pathway to integrate content related to AWS or Azure

Feedback from Reflection from Co-lecturer and Unit Coordinator

Feedback

Constant process change in IBM Cloud results in some laboratory instructions being out of date

Recommendation

The laboratory content will be reviewed at the start of every offering to ensure up-to-date instructions are provided

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Evaluate cloud computing concepts and IoT components for smart applications/systems development
2. Analyse the application of cloud computing and IoT technologies in different scenarios
3. Design and develop cloud based smart applications for business solutions
4. Deploy a smart application using cloud computing and IoT technologies.

The Australian Computer Society (ACS) recognises the Skills Framework for the Information Age (SFIA). SFIA is adopted by organisations, governments and individuals in many countries and provides a widely used and consistent definition of ICT skills. SFIA is increasingly being used when developing job descriptions and role profiles. ACS members can use the tool MySFIA to build a skills profile.

This unit contributes to the following workplace skills as defined by SFIA 7 (the SFIA code is included)

- Systems design (DESN)
- Systems integration and build (SINT)
- Programming/software development (PROG)
- Testing (TEST)
- Release and deployment (RELM)
- Application support (ASUP)
- Solution architecture (ARCH)
- IT infrastructure (ITOP)

Alignment of Learning Outcomes, Assessment and Graduate Attributes

— N/A Level	Introductory Level	Intermediate Level	Graduate Level	Professional Level	Advanced Level

Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 20%	●	●		
2 - Group Work - 30%	●	●	●	
3 - Project (applied) - 50%			●	●

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	○	○	○	○
2 - Communication	○	○		
3 - Cognitive, technical and creative skills	○		○	○
4 - Research		○		
5 - Self-management				○
6 - Ethical and Professional Responsibility			○	
7 - Leadership		○		
8 - Aboriginal and Torres Strait Islander Cultures				

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Written Assessment - 20%	○	○	○					
2 - Group Work - 30%	○	○		○			○	
3 - Project (applied) - 50%	○		○		○	○		

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Node.js and NODE-RED

Referencing Style

All submissions for this unit must use the referencing style: Harvard (author-date)
For further information, see the Assessment Tasks.

Teaching Contacts

Anwaar Ul-Haq Unit Coordinator
a.anwaarulhaq@cqu.edu.au

Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Fundamentals of Cloud Computing and IoT	Chapters 1 and 2 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT and Cloud 1st Edition, by William Stallings.'	Setting up Azure Student Accounts

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Cloud Delivery and Deployment Models	Chapters 1 and 2 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT and Cloud 1st Edition, by William Stallings.'	Cloud Computing Lab 1 & Deno

Week 3 - 18 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Data Centers & Managing Data in the Cloud	Chapter 5 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	Cloud Computing Lab 2

Week 4 - 25 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Cloud Architecture and Design Patterns	Chapters 11 and 12 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	Cloud Computing Lab 3

Week 5 - 01 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic

	Chapter	Events and Submissions/Topic
Cloud Computing and Virtualization	Chapters 7, 8 and 9 from 'Foundations of Modern Networking: SDN, NFV, QoE, IoT and Cloud 1st Edition, by William Stallings'	Cloud Computing Lab 4, Assignment 1- Due: 05/04/2024 11:45 pm **Written Assessment –Evaluation of Cloud Services** Due: Week 5 Friday (5 Apr 2024) 11:45 pm AEST

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Session Break	Session Break	Session Break

Week 6 - 15 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Cloud-based Networking & Security	Chapters 6 and 10 from 'Cloud Computing: Concepts, Technology & Architecture by Erl, T., Mahmood, Z., and Puttini R.'	Cloud Computing Lab 5

Week 7 - 22 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Edge & Fog Computing and IoT	Lecture Slides	Tutorial/Lab

Week 8 - 29 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
AI on the Cloud	Lecture Slides	AI on the Cloud Lab,, Assignment 2- Due:03/05/2024 11:45 PM **Group Work- Research Report** Due: Week 8 Friday (3 May 2024) 11:45 pm AEST

Week 9 - 06 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
IoT, Cloud and Digital Twins	Lecture Slides	Tutorial/Lab

Week 10 - 13 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Management & Governance of Cloud, IoT and Big Data	Chapters 1 and 4 from 'The Internet of Things: How Smart TVs, Smart Cars, Smart Homes and Smart Cities Are Changing the World by Miller, Michael'	Tutorial/Lab

Week 11 - 20 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Smart Problems and Smart Businesses	Chapters 12, 14 and 15 from 'The Internet of Things: How Smart TVs, Smart Cars, Smart Homes, and Smart Cities Are Changing the World by Miller, Michael	Tutorial/Lab

Week 12 - 27 May 2024

Module/Topic	Chapter	Events and Submissions/Topic
Revision	Lecture Slides	Revision, Assignment 3- Due:31/05/2024 11:45 pm **- Smart Application Development** Due: Week 12 Friday (31 May 2024) 11:45 pm AEST

Review/Exam Week - 03 Jun 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review/Exam Week	Review/Exam Week	Review/Exam Week
Exam Week - 10 Jun 2024		
Module/Topic	**Chapter**	**Events and Submissions/Topic**
Review/Exam Week	Review/Exam Week	Review/Exam Week

Term Specific Information

Online

Assessment Tasks

1 Written Assessment –Evaluation of Cloud Services

Assessment Type
Written Assessment

Task Description
This individual assignment revolves around the exploration and evaluation of two prominent Platform as a Service (PaaS) cloud providers - Amazon Web Services (AWS) and Microsoft Azure. The primary objective is to analyze and compare the services offered by each provider, with a specific focus on their Infrastructure as a Service (IaaS), SaaS and PaaS capabilities. . You are also required to create a simple
application in each of the cloud services as part of your comparative exercise. The assignment requires you to:
1. Explore and document the array of services offered by Amazon Web Services (AWS) in the PaaS and IaaS domains.;
2. Evaluate the strengths and weaknesses of each provider to make informed recommendations based on the business scenario provided.;
3. create a simple application in both of the cloud providers; and
4. prepare a report based on the given criteria in the assessment specification.
Detailed information about this assignment can be accessed from the Moodle unit website.

Assessment Due Date
Week 5 Friday (5 Apr 2024) 11:45 pm AEST
Online via Moodle

Return Date to Students
Week 6 Friday (19 Apr 2024)
Online via Moodle

Weighting
20%

Assessment Criteria
Exploration of Cloud Services (20 points)
Comparison of Providers (30 points)
Sample Application (20 points)
Report Preparation (30 points)
The detailed marking criteria and rubrics will be provided in the assessment description on Moodle.

Referencing Style

- [Harvard (author-date)](#)

Submission
Online

Submission Instructions
Submit via Moodle link

Learning Outcomes Assessed

- Evaluate cloud computing concepts and IoT components for smart applications/systems development
- Analyse the application of cloud computing and IoT technologies in different scenarios

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills

2 Group Work- Research Report

Assessment Type
Group Work

Task Description
Task Description
This group assignment must be accomplished in a group of 3 members. The assignment requires you to select
a topic from a given list and research on that topic. You should find scholarly articles (e.g. published journal articles,
books, conference papers) and report current scientific developments relevant to the topic. The investigation should be
done in a team environment that requires you to:
1. choose a topic from the given list based on the given instructions in the assessment specification;
2. research multiple scholarly resources to report the scientific developments relevant to the topic and
3. prepare a report according to the given guidelines in the assessment specification.
Detailed information about this assignment can be accessed from the unit website in Moodle.
The list of topics and rubrics will be provided in a detailed assessment description via Moodle.

Assessment Due Date
Week 8 Friday (3 May 2024) 11:45 pm AEST
online via Moodle

Return Date to Students
Week 10 Friday (17 May 2024)
online via Moodle

Weighting
30%

Assessment Criteria
Research (50 points):
Comprehensive identification of scholarly resources.
Critical evaluation of selected resources.
Proper citation and referencing.
Scientific Developments Reporting (50 points):
Thorough reporting of current scientific developments.
Clear articulation of significance and implications.
Integration of findings from multiple sources.
Adherence to given guidelines.
Clear and organized report structure.
Effective communication of collective findings.
The detailed marking criteria and rubrics will be provided in the assessment description on Moodle.

Referencing Style

- [Harvard (author-date)](#)

Submission
Online Group

Submission Instructions
Submit via Moodle link

Learning Outcomes Assessed

- Evaluate cloud computing concepts and IoT components for smart applications/systems development
- Analyse the application of cloud computing and IoT technologies in different scenarios
- Design and develop cloud based smart applications for business solutions

Graduate Attributes

- Knowledge
- Communication
- Research
- Leadership

3 - Smart Application Development

Assessment Type
Project (applied)

Task Description
In Assignment 3, you will continue working with the same group as your Assignment 2. In this assignment, you are required to analyse a given implementation scenario and issues within it and come up with an intelligent application that will address the
identified issues. You will write a report and create an online video demo to demonstrate the process you followed to create the smart application. The
the assignment requires you to:
1. analyse the given business case and identify issues associated with the business;
2. design a smart application-based solution to address the identified issues;
3. develop and deploy the application on the Cloud and
4. prepare a report (as per the instructions given in the assignment specification) to illustrate your activities during the smart application development.
Detailed information about this assignment can be accessed from the Moodle unit website

Assessment Due Date
Week 12 Friday (31 May 2024) 11:45 pm AEST
Online via Moodle

Return Date to Students
Review/Exam Week Monday (3 June 2024)
After certification of grade

Weighting
50%

Assessment Criteria
Analysis of the Given Business Case & Report Preparation (30 points)
Design of Smart Application-Based Solution (20 points)
Development and Deployment on the Cloud (20 points)
Online Video Demo, Presentation and Professionalism (30 points)
The detailed marking criteria and rubrics will be provided in the assessment description on Moodle.

Referencing Style

- Harvard (author-date)

Submission
Online Group

Submission Instructions
Online via Moodle

Learning Outcomes Assessed

- Design and develop cloud based smart applications for business solutions
- Deploy a smart application using cloud computing and IoT technologies.

Graduate Attributes

- Knowledge
- Cognitive, technical and creative skills
- Self-management
- Ethical and Professional Responsibility

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the **Student Academic Integrity Policy and Procedure**. This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?
A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?
A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?
For academic advice and guidance, the Academic Learning Centre (ALC) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?

Be Honest
If your assessment task is done by someone else, it would be dishonest of you to claim it as your own

Seek Help
If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)

Produce Original Work
Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem